

are then placed in a 100% relative humidity atmosphere. Aggregate A rapidly absorbs moisture, becoming soft and sticky, while aggregate B remains dry and free flowing.

Example 5

Again according to the procedure of Example 1, 100 grams of the liquid silicate, 40 grams of the anhydrous silicate and 5 grams of sodium silicofluoride were mixed, cured, ground and expanded. While having a density of 5 pounds per cubic foot, the aggregate was 91% water soluble.

While the invention has been described by reference to certain specific and preferred embodiments thereof, it is not to be so limited since changes and alterations may be made therein while remaining within the scope of the appended claim.

We claim:

1. Process for preparing an expanded insoluble aggregate based on an alkali metal silicate, which process comprises:

(A) mixing, at a temperature less than boiling, an aqueous alkali metal silicate having an alkali metal oxide:silicon dioxide weight ratio of from about 1:3.0-7.0 with an essentially anhydrous alkali metal silicate within the same weight ratio range, the amount of anhydrous added being that quantity sufficient to give, in combination with the aqueous, a total alkali metal silicate solids content of from 80-40% by weight and the amount of alkali metal silicate solids being 40-90% by weight, dry basis, of the total resultant aggregate;

(B) admixing, prior to the time when the anhydrous alkali metal silicate becomes substantially hydrated, two insolubilizing compounds as follow;

(1) a primary insolubilizer capable of reacting with the alkali portion of the alkali metal silicate at temperatures less than boiling, the

amount used being that sufficient to reduce hygroscopicity of the silicate to the point where caking of the composition prior to expansion but subsequent to grinding is prevented and

(2) a secondary insolubilizer capable of reacting with the silicate portion of the alkali metal silicate at temperatures used in expanding same, the amount used being that sufficient to render the expanded aggregate water-insoluble, the total amount of insolubilizers used being less than the stoichiometric amount required for total reaction with the alkali metal silicate present;

(C) continuing mixing until the components will not separate on standing at temperatures up to boiling;

(D) curing the mixed composition at temperatures up to boiling until the anhydrous alkali metal silicate has become substantially hydrated and the primary insolubilizer reacted;

(E) cooling the composition to a grindable solid;

(F) grinding the composition into discrete nonadherent particles suitable for expansion and

(G) rapidly expanding the particles and causing the secondary solubilizer to react by exposure to temperatures of from about 800°-1800° F.

References Cited

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U.S. Cl. X.R.

106-75